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Wired Smartphones: Rethinking the role of community technology centers in the mobile Internet era

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ABSTRACT

The growing spread of smartphones and mobile Internet has some practitioners and scholars arguing about the possible irrelevance of Community Technology Centers (CTCs) serving low income communities. However, I claim in this paper that although mobile internet is making great strides, it does not yet substitute for public access; actually, smartphones and computers at CTCs compliment each other in providing those who face digital inequalities with a broader sociotechnical experience. In order to explore this problem space this paper asks the following question: "how do marginalized populations perceive CTCs in the mobile Internet era?" To address this question, I draw on an eight-month critical ethnography in the favelas of Vitória, Brazil, to study slum residents' uses of ICTs, such as computers and smartphones. I show how marginalized people who are suffering in a relatively severe living environment take advantage of ICTs in order to both fulfill their needs and address their desires.

Keywords: smartphone, community technology center, mobile Internet, ethnography, ICT4D, favela, telecenter, LAN house

INTRODUCTION

Mobile Internet is growing worldwide due to the lower cost of smartphones and tablets, as well as the ability of wireless infrastructures to deliver far-reaching coverage. Although mobile devices still cannot provide the same experience and functionality as personal computers, the mobile Internet promises to bring a billion or more people online (Morgan Stanley Research, 2009). As described by Donner and Marion (2013), the arrival of this private, accessible, but perhaps not optimal mobile Internet has implications for Community Technology Centers (CTCs) - such as libraries, telecenters and LAN houses - serving low-resource communities.[1]

[1] LAN Houses are establishments, such as cybercafé's, where people can pay to access computers, Internet and video games. Due to the sociotechnical benefits given by LAN houses to the local communities, such facilities are also considered as a CTC.

Some practitioners have suggested that CTCs are irrelevant in the age of mobile Internet (see Ajao, 2010; Samii, 2009). However, in this paper, I suggest that the uses of CTCs and smartphones deserve further investigation, specially in marginalized areas where people face the consequences of digital inequalities.

Favelas, urban slums in Brazil, are considered marginalized areas due to the absence of state social and physical investments. As a consequence of this, such areas lack proper infrastructure, sanitation and road systems and provide their residents, the marginalized, with a low quality of life. The marginalized are deprived not only of proper services for their basic needs, such as health and education, but also lack access to technology and Internet. According to Neri (2012), only 25% of the Brazilians in lower classes, such as favela residents, are connected to the online world, and most of them rely on CTCs such as telecenters and LAN houses, to be connected. Even though CTCs play an important role in providing favela residents with Information and Communication Technologies (ICTs), studies have shown that Internet access on smartphones is also increasing every year among users in poor populations, with an 18% increase in 2014 (CETIC.br, 2014). In the literature, the marginalized have previously been perceived as mere users and consumers of online services; however, due to their growing experience with technology and the affordances of the mobile Internet, there is an urge in ICT4D to see them as agents, active producers and innovators (Rangaswamy & Nair, 2012). Thus, this paper explores this problem space by focusing on the question: "how do marginalized populations perceive CTCs in the mobile Internet era?"

To study slum residents' ICT experience, I draw on eight months of fieldwork including user observations and 56 in-depth and semi-structured interviews in the favelas of Vitória, Brazil. I used critical ethnography (Madison, 2012) to emphasize how marginalized people experience and understand ICTs: putting them at the center of the research and positing that people themselves define the value of these services in their lives. I argue that the practices of understanding, interpreting, and experiencing smartphones and computers at CTCs are embedded in dense sociocultural contexts. I show how marginalized users who are suffering in a relatively severe living environment take advantage of ICTs in order to both fulfill their needs and address their desires. This research contributes to a growing ICT4D literature on mobile Internet by rethinking its implications for CTCs. Also, by expanding the understanding of the use of digital technologies in the favelas, this paper intends to shed light on the significant social and technical

issues facing digital inequalities and Latin America. The outcomes from this paper in the favelas of Vitória can likely inform practical and theoretical work on ICT4D in Brazil and elsewhere..

FRAMING

The focus of this paper is not on the general uses of smartphones, such as text messaging and voice calls, but on the use of Internet on such devices in relation to personal computers in CTCs. Some authors have suggested that the private use of smartphones substituted visits to CTCs, while others claimed that smartphones are irrelevant to CTC users (see Bruijn, Nyamnjoh, & Brinkman, 2009). However, I argue that smartphones and computers at CTCs compliment each other in providing those who face digital inequalities with a broader sociotechnical experience.

In order to explore this problem space and understand the use of ICTs, such as computers and smartphones, I join other authors in the field of ICT4D to analyze these ICTs as social artifacts and as tools that afford development (see Kleine, 2013; A. Sen, 2001; Stillman & Denison, 2014). According to Sen (2009), development is a process of expanding the strength of freedom in the individuals' everyday lives. From a capabilities approach, "development of individuals and communities is about the ability to recognize and access an opportunity, make a choice, and then allow this decision to make a life-enhancing difference" (Rangaswamy & Cutrell, 2012, p. 52). Sen suggests ontologically focusing on human well-being and methodologically focusing on capabilities. Such approach offers a way of thinking which focuses on the marginalized while recognizing their own agency. For the ICT4D literature, it suggests looking at ICTs as multipurpose technologies, which could empower marginalized individuals to attain development outcomes of their own choice (Kleine, 2010).

Hence, in this paper, I define development as the process to realizing human agency. In other words, the ability and freedom of people using ICTs to mobilize themselves toward a quality of life they value and wish for. Thus, in this paper, development requires alleviating sources of unfreedom such as social deprivation, censorship, tyranny, poverty and lack of state investments. This approach allows me to acknowledge the agency of the people who suffer the consequences of marginalization, address processes of unfairness or injustice, and uncover and foster non-Western and nonconventional modes of using ICTs.

METHODOLOGY

To conduct the analysis reported in this paper, I used critical ethnography, which is a natural fit to study marginalized people's understandings of the sociocultural values that ICTs provide. Critical ethnography is characteristic of an immersion in a culture; it puts the marginalized people at the center of the research and posits that people themselves define what lives they value. Thus, it is a powerful method to resist domestication and reposition the researcher from "what is" to "what could be" (Denzin, 2001). Focusing on favela residents through critical ethnography also helps to foster understanding of the complexities of the roles that ICTs play in people's lives and how they relate to the diverse human experiences, considerations that can go unnoticed when the focus is only the economics of ICTs or other more abstract means of analyzing significance (Kleine, 2007). This method represents a compassion for the suffering of living beings (Madison, 2012), a sensitivity towards human freedom, and an emphasis on people's well-being. Using critical ethnography, I conducted an open-ended process of public deliberation, instead of a top-down approach with prefabricated hypotheses, to emphasize marginalized people's views of ICTs and their own accounts of how digital technologies affect their lives.

The favelas of Bairro da Penha, Gurigica, São Benedito, and Itararé - in the city of Vitória, Brazil - were chosen as the study site. Favelas are considered "wrong" places for studying technology because they are outside the main economic, technological, and political centers. But studying peripheral places allows us to learn about them and their importance in today's "knowledge economy" (Takhteyev, 2012). Like other urban slums, Brazil's favelas are typical marginalized settlements occupied by squatters who have limited access to digital technologies and often lack public services, legitimation, education, and financial sufficiency. Favelas are usually "governed" by drug lords who ensure residents' safety through their actions and political connections (Nemer, 2013). By enforcing their own laws, drug lords maintain order in the favelas. Residents in the favelas respect them, because these drug lords create a local ecology where most residents feel safe, despite the high level of violence (Perlman, 2006).

The most famous favelas in Brazil—Rocinha and Cidade de Deus (City of God)—are in the city of Rio de Janeiro. To prove that the city was a safe venue for the World Cup in 2014, and will be safe for the Olympic Games in 2016, police officers have been expelling drug traffickers from

Rio. Drug dealers who escaped are hiding in favelas in nearby cities such as Vitória (do Val, 2012), which makes these slums war zones. Drug dealers from Rio de Janeiro teamed up with the rival cartel from Bairro da Penha and are trying to take over Gurigica and São Benedito. As in other favelas, most people living in Gurigica, São Benedito, Bairro da Penha, and Itararé rely on LAN houses and telecenters to access computers and the Internet. LAN houses are privately owned establishments where—similar to a cybercafé—people can pay to use a computer with Internet access and a LAN. In contrast, telecenters are facilities supported by the state and nongovernmental organizations where the general public can access computers for free. LAN houses, telecenters, and other technology access establishments, such as libraries, are considered community technology centers (CTCs) (Nemer & Reed, 2013). Conducting ethnographical fieldwork in such areas was challenging but necessary: it shed light on the role of digital technologies (e.g., computers and smartphones) in the daily lives of marginalized people who are situated in an extraordinarily complicated social, cultural, political, and economic context.

The critical ethnography was conducted from April to October 2013. It focused on two LAN houses (Life Games, in Bairro da Penha, and Guetto in Gurigica) and two telecenters (one in Itararé and one in São Benedito). I visited two CTCs per day five times a week, and then switched to two different CTCs the following week. This weekly CTC swap continued until the end of the fieldwork, which optimized the time in each CTC and allowed the researcher to reach a larger and more diversified user population. To collect data for this article, I observed user activities in these CTCs and asked potential participants whether they were users of this CTC and would be willing to participate in this study. I conducted 56 in-depth and semi structured interviews with CTC users (14 interviewees from each CTC). These participants visited the CTCs at least twice a week. Thirty participants were female, and 26 were male. Regarding age, 35 participants were between 15 and 24 years old, and 21 were between 24 and 45 years old.

Interviews were conducted in Portuguese and lasted for 45 minutes on average. Interviews were recorded using Google Glass and an audio recorder. The interviews were transcribed and translated into English. The interview and observational data were coded using MaxQDA (http://www.maxqda.com), which aided me in visualizing and organizing the data. I conducted a thematic analysis and identified emerging patterns of ICT use by the participants. Later, the coded data were analyzed to identify patterns in participants' use and understanding of CTC and mobile phone use.

FINDINGS

The social and physical infrastructures of *xinglings*

Favelas were not only known for their social problems, but also for their lack of adequate infrastructure. The urbanization of favelas in Brazil was recent and inefficient. While the government did not forcibly remove favela residents, it also did not improve their lives in the way of infrastructure (electricity, water, gas) or social services. Often as a consequence, favela inhabitants frequently acquired utilities illegally through makeshift wire and pipe taps, called *gatos* ("cats") (Nadaud, 2012). The faulty infrastructure in the neighboring favelas of Gurigica, Bairro da Penha, São Benedito and Itararé did not only affect the physical network, such as cables and water pipes, but also the wireless one. The cellphone carriers did not provide satisfactory signal coverage in the favelas, which lead to constant complaints from the favela residents. Further, walking around in the favelas seeking cellphone bars was dangerous due to shootouts from the intense drug war that was happening during this fieldwork. As mentioned by Fernanda, 17 year old:

> *"My xingling has no bars up in here [at the top of the hill], my calls are never completed and it is really hard to communicate with people from here. I don't even know why I pay for this thing. When I need to make urgent calls, I try to go to Bairro da Penha, forcing me to walk through Av. Hermínio Blackman. You know that avenue is known as the Gaza Strip of Vitória, right?"*[2]

Ironically, the hill where the favelas were located was known as the *Morro da Antena* (Hill of the Tower) with reference to the cellphone tower located on the top of the hill. Due to its lack of utility for the favela residents, some informants did not even know what the tower was for, as mentioned by Rodrigo:

> *"I come up here on the hill almost every week. l guess that's one way to move up in life. I never went up this crazy thing [cell phone tower] but I look at it and see that there's still more to achieve. It gives me hope."*

[2] Xingling is a term that was used to refer to cheap Chinese imitation and pirated brands, such as HiPhone, Galaxia, and Lumiax.

During the fieldwork, the major cellphone carriers, Vivo, owned by the Spanish *Telefónica*, and the Italian owned *TIM*, were under investigation by the State Prosecutors for carrying out a sort of social segregation. The carriers' customers who were in peripheral neighborhoods of Vitória had more difficulty to complete calls than users who were in richer locations (Campos, 2012). According to the *Agência Nacional de Telecomunicações* (National Telecommunications Agency, which is referred to as its acronym ANATEL) the phone carriers offered a blocking rate (calls that are not completed) in the studied favelas greater than 5%, which was maximum rate allowed by the agency.[3] In São Benedito, the average blocking rate was of 15%, and in Bairro da Penha, Gurigica, and Itararé was of 8%. The State Prosecutors were working with ANATEL to find plausible punishments to the cellphone carriers; one of the discussed penalties was suspension of SIM chip sales from such carriers (Campos, 2012). According to the Prosecutors: *"users (...) were being discriminated against in relation to the enjoyment of the carriers' network service, i.e. the blocking rate was much higher in some peripheral neighborhoods within Vitória, while in others this rate was negligible"* (Campos, 2012).

In Brazil, smartphones were expensive because import taxes were high and the country did not have domestic manufacturers. The carriers' coverage was satisfactory in wealthier areas, however their services remained expensive. Favela residents relied on *xinglings* and pre-paid plans in order to maintain a cellphone number and receive calls at the minimum cost. *Xinglings* were not quite used as *smart phones* except when Wi-Fi was available, since the carriers' infrastructure segregated the favela users from proper wireless services and they could not afford data packages. The *xinglings* were cheaper since they were smuggled in the favelas by people related to the drug cartel and sold in the black market. The cartel had a deal with the sellers, who gave 30% of the sales to the traffickers in exchange for protection. The sellers were mostly secretive about the origins of the smartphones, but as former black market cellphone seller

[3] Block rate is the percent of calls offered that are not allowed into the system; generally % receiving busy, but may also include messages and forced disconnects. Blocking rate is an important metric to consider, ensuring you are allowing your customers access to your center. It is generally kept very low (under 1%) (TechTarget, 2015).

Rafael (23 years old, from Bairro da Penha) mentioned, *xinglings* were smuggled in from China through Paraguay.[4]

The *xinglings* only came with a charger and did not have warranty. The constant power outages in the favelas often fried the chargers, which were of bad quality, and sometimes damaged the smartphones. The favela residents felt neglected since they did not have the money to keep buying new chargers. Hence, sharing cables and power cords was an activity that affected group formations and power relations, as mentioned by Felipe:

"Here, we purchase xinglings in the back alleys or in the neighborhood market. If you're lucky it comes with a charger and that's it… the charger lasts a week. I bought the USB cable separately and now everyone wants to go to the Telecenter with me so they can transfer the photos to the computer and upload them on Face [Facebook]. I've got tons of friends and respect now. I'm even picked first to play soccer."

The smartphones were seen as precious materials in the favelas. The users were afforded with bargaining power and had the possibility to exchange their *xinglings* for pretty much any good they desired, as expressed by Janine, 21 years old:

> *"Cellphones are the most democratic kind of money here in the favela; they're worth a lot and everyone needs one. I can buy one in the back alley… talk to everyone… and then if I want to buy something else, I just trade it for something else. The other day I was crazy about a bike I saw. What did I do? I didn't think twice and offered my cellphone… the trade was fair. This cell phone will still come back to me."*

Smartphones gave favela residents a sense of being included socially. They felt more courageous to cross social boundaries when they possessed the device. Marcos was the only informant who had a smartphone from a major manufacturer: Galaxy S3 by Samsung. His mom purchased the phone for him in April 2013 and was able to afford it because the store financed the phone – she had to make 18 monthly payments to avoid APR interest:

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[4] The route China – Paraguay – Brazil is known for the intense black market traffic of fake goods made in China. Such goods are brought to Brazil by smugglers who cross the border bridge, called Friendship Bridge, between Ciudad del Este (Paraguay) and Foz do Iguaçu. It is estimated that more than 30 billion dollars worth of fake goods cross the bridge every year. See Pinheiro-Machado's (2008) ethnography entitled *"China-Paraguai-Brasil uma rota*

> *"I got the phone from my mom. This smartphone makes me empowered, because I can just go around to Praia do Canto or Jardim da Penha [rich neighborhoods] and not worrying being judged as poor or favelado. When I went to the mall the other day, I had my cellphone in my hands the whole time, it felt like it worked as a key and was opening every door I was walking thought."*

As observed in the CTCs, the *xinglings* were also shared among groups of 3 or 4 friends since not everyone could afford to buy one. Usually, each person of the group would contribute to the *xingling* experience: one would bring the smartphone, one would bring the USB cable, and another would bring a charger. When offline, favela residents used *xingling* mainly as cameras, music and video players.

The CTCs also fulfilled the role of being the wireless hotspots of favelas. In the Telecenters' computer room, the users were not allowed to talk or play music (loudspeaker) on their cellphones, but they were allowed to connect to *Vitória OnLine* and browse the Internet on their *xinglings* either inside or outside the computer rooms.[5] In the LAN houses, the users had to pay a fee of R$2.00 (approximately U$0.75) per hour in the centers' Wi-Fi – which was cheaper than 1 hour on the PC or videogame (R$3.00). Favela residents perceived the *xinglings* as an extension to the CTCs. Although the devices were mobile, accessing the Internet was still bounded to such centers. CTCs provided a place for their users to not only lend their cables and cords, but also to promote other social dynamics. For example, it served as a gathering place where female teenagers went to the bathroom to take selfies so they could share them later on Facebook.

Navigating between *xinglings* and computers

When on the Wi-Fi networks, the CTC users mostly chatted on Facebook messenger and played Facebook games. Content, such as photos, was not directly uploaded to Facebook from their *xinglings*. For example, a smartphone used by the female teenagers had several photos of different people, so they preferred to first upload their photos to the CTCs' computers so they

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para pensar a economia informal (*China-Paraguay-Brazil: a route to discuss the informal economy*)" for detailed information.

[5] *Vitória OnLine* is an open and free wireless network maintained by the City of Vitória, which were accessible in several public places such as municipal parks, city government buildings and Telecenters.

could chose the best photos, do some basic editing and distribute them in an easier and faster manner instead of signing into each teenager's account and upload a photo through the *xingling*. Alice mentioned that she prefers to use Facebook on the computer since it offers a better experience than on smartphones:

> *"I can't use it [xingling] the way I want. Like on the screen, most of the websites turn into English in the mobile version. I like to use the computer because on the phone it doesn't work quite right. It is not easy to use the phone… all these terms that I don't understand. I have lots of difficulties in downloading stuff from the Internet: music, photos, videos…"* (Alice, 19 years old)

Downloading content from the Internet also worked in this manner: they first downloaded music or videos to the CTCs' computer, to check if the files were not corrupted, and then they transferred them to their smartphones through a USB cable. Hence, CTCs became an important place that filled in the gap with services that the unstable infrastructure was not always able to deliver. Since walking around in the favelas was risky, most users tried to download as much content as they could, for example the latest *forbidden funk* songs, so they would only need to go back to the CTCs, and be at the danger of crossing territory boundaries, when necessary. Music played a big role in entertaining the users, as mentioned by Roni, 21 years old:

> *"I come here [Telecenter] to transfer songs to my smartphone. Music is everything in my life. It sets me free, like when I read a book. The music goes well according to my mood, but everything in life is music. Car noise is music, tin banging is music… Music is like a world where there's no prejudice and judgment, and the smartphone is like the spaceship that takes me there."*

As mentioned by Roni, his *xingling* allowed him to "be" in a place where he felt comfortable. Monica, 17 years old, found in her smartphone a safer place to express her individuality, feelings and emotions:

> *"I can't go out and scream my pain, I fear the consequences. They will either think I'm crazy or the drug people will "silence" me. So I usually come here and sit right at that little bench [the bench was at the corner of Guetto LAN house and a little market]. I have a deal with Perla, and she let's me use the WiFi whenever I want, and I pay just R$10,00 [approximately US$4.00] a month. With this phone [a xingling] I feel like my friends can*

> *always hear me, you know? Like they can listen to my feelings. I can scream my pain on Face and I will get support. I feel safer and as a real human being."*

Xinglings were powerful enablers of photography and video recording, but since the users had issues with the carriers' networks and they did not know how to publish content through the CTCs' Wi-Fi, uploading or downloading audio-visual media was done on the CTCs' computers. The CTC users navigated the interrelated constraints and affordances made available via the computers in the CTCs and private mobiles and benefited from the different functions available on different platforms (computer or smartphone). They used computers for more resource-intensive goals and media production, such as typing their CV on a word processor and editing their selfies, and turned to their *xinglings* for time-sensitive goals, such as Facebook chat and photos. No one used word processors or performed complex tasks on their *xinglings*, similarly no one took pictures with the webcam available on some computers. Time and money were also constraints that determined which platform the informants used. Although their preference was computers, they did not always have enough money to use the computers at the LAN houses or their free time at the Telecenter had expired. Thus, some CTC users relied on their *xinglings* to overcome such constraints, as mentioned by Ricardo:

> *"I prefer to use the computer… I can barely use this phone, it is hard to type and see what is going on. It is good for [Facebook] chatting and taking photos, but downloading a webpage on it is so painful… Every time the Telecenter is packed and there is a long wait to use the computer, I get on the free Wi-Fi to pass the time and chat. Also, when I want to do something quick like telling a friend I'm coming over, I get on the Wi-Fi of Ghetto LAN house and send the message, this way it is much cheaper."*

Through *xinglings*, CTC users posted selfies, which were an important channel that promoted safe and efficient communication among their peers. Due to the conditions in the favelas, the residents felt oppressed wherever they went: If they hung out in the streets, they felt that the drug lords in control were watching them. If they went outside of the favelas, they felt discriminated by the society and targeted by the police. They considered Facebook as a safer place to express their true feelings, thoughts, and personalities while escaping from the drug lords' censorship. André, 20 years old, describes the context for his posting of a selfie on Facebook:

> *"Today I had to walk through a shooting in Itararé. The police cars were flying by . . . you should have seen it. . . . I'm just very grateful I'm still alive, but at the same time I'm furious to have to face this situation almost every week. Today I posted a photo of myself expressing my gratitude of being alive. . . . I can't say much more than that because I'll have trouble with people involved in this shooting."*

For André, taking and posting selfies had nothing to do with narcissism or attention seeking. To the contrary, as a resident of a dangerous area run by drug lords, André did not seek public attention at all. His selfie was a strategic way to show his grief about the shooting he witnessed, his disappointment about his current living situation ("furious to have to face this situation almost every week"), and his expectation for a better life ("my gratitude of being alive"). His selfie practice was embedded in a socioculturally dense context and cannot be reduced to a simple act of self-promotion. Felipe, a 13 years old frequent user of Life Games e LAN house, usually used his selfies to let his mom know where he was and give her a sign that he was safe:

> *"My mom works the entire day and I have nothing to do after school. . . . I love playing soccer on the streets, but it is dangerous due to the [drug] street managers wanting new people in their team. . . . I always post photos of myself to show my mom where I am and that I'm OK . . . . she always checks her Face [Facebook] at work during her breaks . . . there's a computer there they can use."*

For Felipe, being on the streets without adult supervision was dangerous, because the drug traffickers were always looking for new recruits to expand their cartel. Using selfies became a fast and efficient way to communicate with his mother and provide her with visual evidence that he was safe.

You have a *xingling* – why are you at the CTC?

CTCs were environments vital to mobile media literacy. The constant sharing of *xinglings*, and cables, among users allowed them to help each other out, discuss and try new functionalities on the smartphones. The devices ran on an Android-like operating system, however the owners did not have access to the Google Play app and could not download Google apps. Each *xingling* seemed to have a different application to download mobile apps, and as I observed the informants trying it, it was hard for them to search and install apps such as Gmail and *Snapchat*.

Hence, most of the users simply stuck with the apps that came with the phone, like Facebook. The Telecenter Inclusion Agents and LAN house owners tried to teach the CTC users how to use their mobile devices.[6] However, they were constantly busy watching the place, fixing computers, or helping users that had paid for the hour (in the case of LAN house owners), so they could not find the time to properly help the users of mobile devices. The users often inquired about issues related to media production, such as video recording and effects on photos:

> *"Here in the Telecenter we end up knowing about almost every kind of technology. I have no idea where they [users] buy these cell phones [xinglings], these devices are so sketchy… I help them however and whenever I can, they are not easy to operate, but if you spend enough time on them, you can do something cool, and that's what I can't do. I'm always busy trying to help someone that is on the computer or someone that want's to print their CVs. Thus, I teach them how to transfer the photos to the computers and how to edit the photos on a website, it is easier."* (Inclusion Agent of Itararé).

The CTCs' waiting room worked as an *information ground* where users shared their life experiences, technical expertise and became aware of what was going on in the favelas.[7] It was a social space where users had casual interactions that lead to meaningful exchanges: female teenagers grouped around a *xingling*, pushed the phone's buttons, and discussed how to take selfies until they figure it out. Male teenagers scheduled *peladas* and tried to get on the security computer.[8] [9] Adults exchanged information about social programs provided by the government, such as the social driver's license (*CNH social*) and *ProUni*. In the Telecenters, the users felt comfortable and "at home", as mentioned by Marco, 15 years old:

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[6] Inclusion Agents are the people responsible for taking care of each Telecenter, promoting computer related workshop and classes and help the users.

[7] As defined by Fisher et al. (2006), an Information Ground is an environment temporarily created when people come together for a singular purpose but from whose behavior emerges a social atmosphere that fosters the spontaneous and serendipitous sharing of information.

[8] Social Driver's License (CNH Social) was a social program in which low income adults could apply for a grant to pay for their driving school and license. The process of getting a driver's license can cost up to US$1,000.00. ProUni is a program that granted full and partial scholarships for low income people in private institution of higher education.

[9] Pelada is a term in Portuguese to refer to pickup soccer. Palada means naked (in a female form) in reference to the naked and rough conditions that fields were usually found.

> *"The Telecenter is the best thing we have around here… I always bring my xingling to transfer some music… You know, you realize you are at home when your xingling connects automatically to the Wi-Fi."* (Marco)

Favela residents perceived CTCs as a safe, trusted, and friendly place where they felt it was easier to disclose their true feelings and deepest thoughts. Although free WiFi was available in the Telecenters, users did not upload their selfies directly from their xinglings, because they were generally unaware of the open WiFi network or how to use it. They usually first transferred their selfies to desktop computers in the CTCs via a USB cable and then uploaded the photos to Facebook. However, the CTCs were more than just physical places to upload selfies. In CTCs, participants felt more relaxed, comfortable, and happier.

> *"I have a computer at home, but it is so boring to stay home alone. Here I have my friends, we can talk, play, and take photos. They help me with stuff I don't know, and I help them with things I know… so much happens outside the Internet, in real life, that influences how we actually use the Internet."* (Mariana)

Following Mariana's claim and my own observations, a lot happened offline that shaped the way users used the Internet. For example, teenager girls frequently used Facebook chat, and instead of having the conversation with just the person on the other side of the screen, they often debated the topic of the conversation with each other in the Telecenter before responding. I also observed users that were acquainted, developing a relationship because they helped each other, Carla explains:

> *"I come here to hang out with my friends, not just to use the computers. . . . I go to the bathroom and take photos with my friends. . . . I don't have a large mirror like that one [in the bathroom] at home, so here I can fit everyone in one photo. . . . I love the Telecenter, here I feel safe and in these photos [selfies] I can show my happy side, my real self . . . because in the dangerous streets, unfortunately, I'm always showing my worried and anxious side."*

For Carla and her friends, taking selfies in the CTCs enabled them to show a "happy side" of their unhappy lives. Hanging out and taking photos with friends in a safe (and nicer) place comforted and encouraged them, making them stronger and braver to face their unhappy and unsatisfactory lives ("dangerous," "worried," "anxious"). As I described in the section before,

these users understood selfies as another example of people using social media to project a better, and curated image of themselves. They used selfies to escape from the powerful drug lords' control of their everyday lives, to implicitly express their objections to inequity and violence, to enhance their reflections of their true selves, and to gain self-comfort and self-encouragement.

DISCUSSION

Marginalized areas, such as favelas in Brazil, are ecologies where the physical access to digital technology is still a problem. Favela residents had to comply with CTCs hours and policies, such as 1 hour per day in Telecenters or paying R$3.00 per hour (approximately U$1.00) in LAN houses. The adoption and use of mobile phones by the locals were a response to, and constrained by, issues related to physical access and the contextual limitations that are specific to such areas. Favela residents have repeatedly selected strategies and explained how these strategies enabled them to deal with harsh conditions in their environment: for example, to circumvent faulty infrastructure, safety and security problems induced by the drug cartels. In this paper, I described how favela residents used mobile phones and computers at CTCs in complimentary ways in order to achieve their desires and goals. Since they lived under conditions that needed development in order to assist them to improve their position in society, they promoted development through other means as they demonstrated to be conscious and active users of ICTs, which empowered them by enhancing their agency advantageously within their own environments. This research has also shown how they found alternative ways around the limitations and managed to empower themselves by recognizing and accessing an opportunity, using mobile phones and computers in the CTCs, making a choice and then allowing this decision to make a life-enhancing difference. These choices and decisions made by the informants were guided by what was important to them and how technology could be used to meet their needs.

The findings presented in this paper expands Donner and Marion (2013) by questioning the declaration of digital inclusion promoted by mobile Internet. Though this study is not the first to refute the overstatement of how mobile Internet promotes digital inclusion (see Burrell, 2009; Donner & Walton, 2013; Gurumurthy, 2010), it also shows the continuing importance of safe, well-equipped venues such as CTCs. These findings also suggest that even though the adoption

of mobile Internet is expanding quickly, computers in particular still play a key role in resource-constrained. People who could, in theory, be "mobile-only" Internet users have instead constructed a "mobile-centric" repertoire, relying on the CTCs to complete certain tasks required by school and work as well as to save money (Nemer, 2015). As suggested by the findings, *xinglings* played a central role in participation in network-based peer interactions, but the CTCs were central to other kinds of participation. Thus, we can infer that public access continues to offer, at this time and in this population, critical value in certain activities. Mobile internet is making great strides, but does not yet substitute for public access, considering hardware, network, cost, space, printing, and guidance (Donner & Marion, 2013, p. 11-12). Following, public access via the computer and private mobile access may be different enough to complement rather than substitute each other. This finding echoes those in the context of education, suggesting that while phones are used extensively in educational contexts, computer users enjoy a wider range of choices and greater convenience (see Best, 2008; Gomez, Ambikar, & Coward, 2009).

CONCLUSION AND POLICY RECOMMENDATION

Mobile phones in the favelas of Brazil provide a particularly striking illustration with regards to the multiple meanings that may lie within the differing scales of technological systems. While the larger, systems-level picture is one of dysfunction and segregation by the major wireless carriers, with areas of the city delimited by their (in)ability to receive calls, at a more intimate level the smuggled *xingling* smartphones are clearly an integral part of everyday life, affectionately described by their users as “doors” leading to better (or at least, *other*) places.

The shared *xingling*, unlike the dystopian and individualistic smartphone experience that Western movies like *Her* envision, fosters a communal sociality that emerges out of conditions of technological unevenness and lack: friends gather at the CTCs with one bringing a charger, another the data cable, and the third the *xingling* itself, in order to load data on to and off the phone. In the interlocutors’ accounts, USB cords—those *wired,* material connectors—were a bridge to a more joyous and richer social life. *Xinglings* were keepers of exchange-value within the *favela* (tradable for other goods) and sources of confidence in spaces outside of the favela.

The ethnographic accounts presented here offer a practical and conceptual divide between the uses of CTCs’ computers and smartphones. The findings show little evidence that the demand

for CTCs in socioeconomic marginalized communities, where the number of smartphone users is increasing, will decline in the near future. Thus, I highlight how favela residents integrate personal computers at CTCs with their mobile devices in order to suggest changes in rules and policies. By doing such, we can promote CTCs that are more smartphone friendly, and help the marginalized connecting to the Internet through different channels, instead of waiting for the private sector to provide decent coverage and/or cheaper plans.

Based on this paper's findings, I recommended one policy change to the manager of Telecenters and LAN house owners, which aims at promoting the integration of smartphone and CTCs. As I described in the findings, the computers in the CTCs played a vital role in the users' experiences with smartphones, or *xingling*. Some users brought their smartphone to the CTCs in order to post their photos on Facebook, download music, and take photos with their friends. However, some users were confused by the "No Cell Phone" signs on the Telecenters' walls, as shown in Figure 1, and did not dare to bring their phones inside the computer rooms. Smartphones, when connected to either the CTC's WiFi or computers, could increase the efficacy of a 1-hour slot in Telecenters and be a cheaper option for Internet use at LAN houses. Also, phone storage could cut down on the cost of printing school material.

Inclusion Agents and LAN house owners, according to Donner and Marion (2013), may benefit from specific training and encouragement oriented towards the opportunities presented by the WiFi networks: *"with the proper skills, they could help [CTC] users save time waiting for shared resources and encourage them to get more out of the Internet on their [xinglings]. They also need new skills to help mobile-centric users with things like configuring email on phones to searching, cloud storage, and local caching, and less technical (but critical) skills, such as managing time, contacts, online reputation, and use of mobile-accessible resources for leisure and school"* (p. 13). Hence, promoting explicit rules about smartphone use could improve the experiences of those facing digital inequalities with ICTs.

Figure 1: "No Cell Phone" Sign in Itararé's telecenter.

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